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Store Operations Dashboard Project

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by

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Abstract

The client is one of the leading retail companies in the country. It owns a lot of stores, which is more than 1,000 all over the country. The client is currently required to generate all the performance reports manually for each store individually. This takes a lot of time and effort. And sending the reports is also a challenge in some situations. So, the client decided to handle this situation by building a dashboard where store managers can see a complete and detailed daily performance report of the store.

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Chapter I: Introduction

Introduction

The client is an American retail company founded in the 1900s. Its departmental stores sell a wide variety of merchandise including toys, furniture, clothing, house décor and small electronics, etc. To get continuous growth in retail industry company always needs to well aware of every store performance on a daily basis. It will help in maintaining the stores properly. But it is not an easy thing to get the performance of every store on a daily basis.

The client used to generate the performance reports manually, which involves a lot of human power, time, and cost. To avoid that the client developed a store operations dashboard.

Problem Statement

The reports were being manually generated by Business office for each store and were being mailed to each store individually. It used to take a lot of time and effort. Almost 1000 stores records were needed to be updated on a daily basis manually, which consumes a lot of hours.

Nature and Significance of the Problem

The store managers at various locations were facing issues in getting daily performance reports. The previous process involves the team in the main office manually updating the details of all stores, calculate the daily performance and prepare a report, then they provide that information to the store managers through mail. The members of the business team had to load all the store data into excel

sheets and use excel functions to calculate all the metrics that are needed for performance reports.

The problem becomes more complicated to generate reports for each store individually, calculate the daily performance of each store and send those reports to every store individually.

Objective of the Project

The main objective of this project was to provide an easy access to the store managers, a complete and detailed daily performance report of the store in a less time-consuming manner.

The other objectives of this project include:

- Collect the metrics for the following dashboard buckets: “Employees”, “DTS Activity”, “Employee Scheduling Activity”, “Rewards”, “Sales and Conversion”, “Sales (Furniture, LTP, and Warranties)”, and “Sales Reducing Activities.”
- Automate the data feeds from source files into DW so that we do not have to do that manually every time we generate the reports and can access that data easily.

Project Questions/Hypotheses

- What are the metrics we need to collect and based on which objectives they are measured?
- Will the collected metrics be sufficient to achieve the desired output?

- What percent of time efficiency will be achieved with the excel-based store dashboard?
- What are the satisfactory levels of the end user?

Limitations

This project is the phase one of the whole process. At this stage, the dashboard can be sent only through email. The only thing lacking at this stage is store managers will not have access to entire data. This is only possible when they have the web or mobile application which is going to happen in the next phases. And in this phase, the dashboard will be provided only to store managers.

Summary

This chapter gives the brief introduction about the project. This chapter is meant to introduce the aspects of the project like scope, objective, nature and significance of the problem.

Chapter II: Background and Review of Literature

Introduction

This chapter focuses on reviewing the literature related to the problem, the background related to the problem and the actual methodology that is being implemented in solving the issue.

Background Related to the Problem

The client is one of the largest retail companies in the country. It employs over 40,000 associates across the country and operates approximately 1,000 stores all over the country (retrieved from source website of the company). It sells a wide variety of items like toys, furniture, housewares, clothing, small electronics, food, and beverages, etc. The main problem was, the daily performance reports were generated by business office manually and they used to send those reports to each store through the mail. The issue was, store managers were facing problems in getting performance reports in time. And it was not an easy job to generate daily reports manually. It takes a lot of time, effort, and money. The main focus of this project was to give easy access to the store managers all the data they needed to improve the store performance. This can be achieved by building a dashboard. This project is building an excel dashboard. In the near future client also wants to develop the web and mobile applications so that store managers can have easy access to the data anytime they want. All the data is automated so that there is no need to update everything manually. This project needed to achieve both time efficiency and data efficiency.

Literature Review

This literature review primarily focuses on the preliminary work in identification of necessary elements expected in the project and necessary fields expected in the project.

PeopleSoft. PeopleSoft applications offer a wide range of query and reporting possibilities. PeopleSoft HRMS is an integrated suite of applications and business processes that are based on PeopleSoft's Pure Internet Architecture (PIA) and enterprise portal technologies. The sophisticated features and collaborative, self-service functionality available in PeopleSoft HRMS enable to manage human resources from recruitment to retirement while aligning your workforce initiatives with strategic business goals and objectives. Main concepts in HRMS are tables (Control tables, transaction tables, and prompt tables), Business units, table sets, set IDs, Effective dates, and Person or position structure (Oracle PeopleSoft Enterprise, 1998,2010).

Empower. The Empower system is a total chromatography and results in a management system that one can adapt to their individual chromatography requirements. The empower system mainly has three components empower computer, empower software and empower database. This allows control instrumentation and acquires data; process data interactively or in the background, customize management of project information, customize report design and generation, and adapt operations to methods development, research, or quality control and test environments (Waters Corporation, 2002).

Data warehouse. A data warehouse is a database, which is kept separate from the organization's operational database. It possesses consolidated historical data, which helps the organization to analyze its business. It helps executives to organize, understand, and use their data to take strategic decisions. A data warehouse is constructed by integrating data from multiple heterogeneous sources that support analytical reporting, structured and/or ad hoc queries, and decision-making. Data warehousing involves data cleaning, data integration, and data consolidations (Tutorials Point (I) Pvt. Ltd., 2014).

Excel dashboard. Creating a dashboard in Excel is not the same as creating a standard table-driven analysis. It is tempting to jump right in and start building away, but a dashboard requires far more preparation than a typical Excel report. It calls for closer communication with business leaders, stricter data modeling techniques, and the following of certain best practices. A dashboard is a visual interface that provides at-a-glance views into key measures relevant to a particular objective or business process. A dashboard consists of three key attributes.

- Displays data graphically (such as in charts), Provides visualizations that help focus attention on key trends, comparisons, and exceptions.
- Displays only data that is relevant to the goal of the dashboard.
- Contains predefined conclusions relevant to the goal of the dashboard and relieves the reader from performing his own analysis (Alexander & Walkenbach, 2010).

Literature Related to the Methodology

DLC. SDLC is the acronym for Software Development Life Cycle. The below figure (Figure 1) shows the SDLC process (Software Development Life Cycle, n.d.).

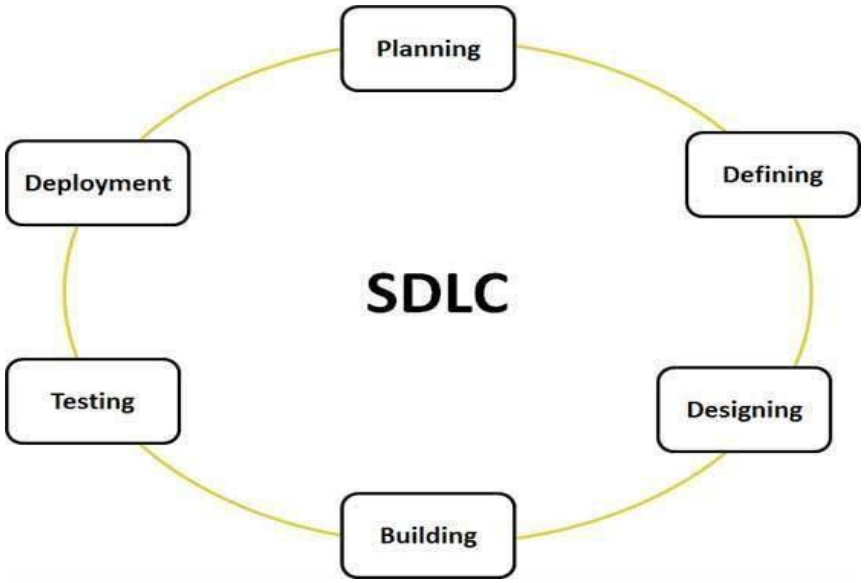


Figure 1. SDLC process.

Planning and requirements analysis. Requirement analysis is the initial phase of the Software Development Life Cycle. The goal of this phase is to understand the client's requirements and to document them properly. The emphasis in requirement analysis is an identifying what is needed from the system. It is most crucial phase in Software Development Life Cycle. The output of requirement analysis is Software Requirement Specification (SRS) (Kumar, Zadgaonkar, & Shukla, 2013).

Defining. Once the requirement analysis is done the next step is to clearly define and document the product requirements and get them approved by the customer or the market analysts. This is done through 'SRS'–Software Requirement

Specification document which consists of all the product requirements to be designed and developed during the project life cycle (Tutorials Point, n.d.).

Designing. SRS is the reference for product architects to come out with the best architecture for the product to be developed. Based on the requirements specified in SRS, usually more than one design approach for the product architecture is proposed and documented in a DDS–Design Document Specification. This DDS is reviewed by all the important stakeholders and based on various parameters as risk assessment, product robustness, design modularity, budget and time constraints, the best design approach is selected for the product (Tutorials Point, n.d.).

Development. In this stage of SDLC, the actual development starts and the product is built. The programming code is generated as per DDS during this stage (Tutorials Point, n.d.).

Testing. In the testing phase, the results of the implementation phase are run through a series of tests to verify that it functions and that it meets goals of the requirements phase. A testing plan is created to describe the unit tests and system tests that will be performed. Unit testing is performed on individual software components. System testing is performed on the software system as a whole. (Software Development Life Cycle, n.d.)

Deployment and production support. Once the product is tested and ready to be deployed it is released formally in the appropriate market. After the product is released in the market, its maintenance is done for the existing customer base (Tutorials Point, n.d.).

Agile methodology. The methodology approach used in this project was an Agile methodology for software development. Agile methodology is a combination of iterative and incremental process models. The idea of revisiting phases over and over is called “incremental and iterative development” (IID). The development lifecycle is cut up into increments or “iterations” and each iteration touches on each of the traditional “phases” of development. IID will focus on process adaptability and customer satisfaction by rapid delivery of working software product (Szalvay, 2014).

Summary

The main purpose of this project was to reduce the cost, time and effort in generating the performance reports. Main technologies used in the project are explained and brief rationale of the methodology is also discussed in this chapter. Further, detailed can be read in the following chapter.

Chapter III: Methodology

Introduction

This chapter introduces a detailed understanding about the design of study and data collection process. Timeline and budget involved in the project will be discussed.

Design of Study

The approach was both qualitative and quantitative. The design of study for this project is done in four different phases.

Phase one: Planning, requirements gathering, and analysis. Once the business team initiated the project, the team specified the business requirements for the project. To understand the requirements of the project, the first thing the team needed to do was gather all the information from the store managers who will be using the dashboard once it is deployed. Once they gathered the information, they analyzed all the data and identified the dashboard buckets. Then they collected all the metrics and attributes for the dashboard buckets. After the collection of metrics, the analysis part took place. Every metric gathered was analyzed and defined clearly. This information was used to plan the basic project approach and to conduct the feasibility study in economical, operational and technical areas. All the requirements are properly documented. “Employees”, “DTS Activity”, “Employee Scheduling Activity”, “Rewards”, “Sales and Conversion”, “Sales (Furniture, LTP, and Warranties)”, and “Sales Reducing Activities” are the main dashboard buckets. Once the project requirements were defined, it was also important to understand the scope of the project shown in table 1. It is important because when the developer starts his

development tasks he has to have a clear idea of the limitations and boundaries of the data.

Phase two: Designing and development. Based on the requirements document, system and software design was prepared. It describes desired features and operations including the layout of the dashboard and other documentation. In this stage team also described the excel table layouts for each bucket in the dashboard. Actual development of application built in this phase.

- Every metric was properly defined and did all the calculations needed to obtain the final value.
- Developed excel table for each bucket of the dashboard,
- Automated the data feeds from source files into DW,
- Developed the reports to be manually run.

Table 1

Project Scope

Project Scope
In Scope: 1. Identify Key stores to send out the Performance KPI's 2. Develop the Information Delivery Mechanism to the stores. 3. Timely Caching of Reports and Dashboards as per the Data Requirements 4. Develop the Metrics and Attributes required for the stores to get their Performance on a daily basis 6.Develop a Feedback Button to Ensure the stores give out Feedback on the KPI's on a daily Basis
Out of Scope 1. Real-time Data Trickle Flow into Mobile App. 2. Putting The Point of Sale on Mobile Devices 3. Enabling the Email of KPI's from the stores.

Table 2 shows the sources of each bucket.

Table 2

Source Files

s.no	Dashboard buckets	Sources
1	Employees	People soft
2	DTS Activity	Empower
3	Employee Scheduling Activity	Empower
4	Rewards	Finance dept. and DW
5	Sales and Conversion	
6	Sales (Furniture, LTP, and Warranties)	DW
7	Sales Reducing Activities	DW

Phase three: Testing. In the testing stage, different types of testing techniques were performed. After the application was tested, the team distributed the reports to STL's, RTL's, DTL's and select Executive management.

Phase four: Deployment and production support. All the selected managers find the dashboard helpful and they sent the feedback. Then the dashboard was sent to other stores along with the store dashboard the team sent the feedback form to the store managers. They get the feedback from stores on the KPI's on a daily basis.

Data Collection

Data collection is the most important part of this project. It is the process of collecting useful data from source files. Here, data should be collected from different sources, which makes the process more difficult.

Excel tables for each bucket of the dashboard were developed before we automated the data. All the metrics for each bucket were clearly defined. Collected the entire data from the source files by automating the data feeds from source files to DW. Reports were designed and developed with the collected automated data.

Data Analysis

The data collected from the store managers was analyzed and identified the requirements. All the requirements were properly analyzed and defined for each and every metric. Once all the data was collected from source files, the data was analyzed and the dashboard was developed using excel. All the data analyzed was showed in graphical form like pie charts, graphs, etc.

Budget

The project was completed within the cost that was estimated by the Business Analysts, there were no additional costs that were incurred during the development of the project.

Timeline

The duration of this project was 6 months in which the dashboard was developed, tested and deployed.

Table 3 shows the various stages of the timeline.

Table 3

Timeline

Stages	**Timeline**
Requirements Gathering and Analysis	Feb 2016
Design and Development	Feb 2016 – May 2016
Testing	May2016-June 2016
Go live and Production support	June 2016-July 2016
Final defense	July 2016

Summary

This chapter in detail explains about the approach to the project. It gives a brief introduction to data collection process. Further, it explains about the budget and

the timeline for the project implementation and deployment. Step by step data analysis procedure will be explained in the chapter.

Chapter IV: Data Presentation and Analysis

Introduction

This chapter will explain in detail what was done during data analysis and it explains in detail the exact procedure and steps. The data collected will be presented.

Data Presentation

The dashboard mainly has seven dashboard buckets. Those are “Employees”, “DTS Activity”, “Employee Scheduling Activity”, “Rewards”, “Sales and Conversion”, “Sales (Furniture, LTP, and Warranties)”, and “Sales Reducing Activities”
Metric and their definitions:

The process starts by collecting the metrics of each dashboard bucket and defining each metric of dashboard bucket clearly. The tables below show the metrics of dashboard buckets and their definitions. The tables have three columns. Those are a metric header (name of the metric), source (location of the metric), and definition (definition of the metric) respectively.

1. **Employees:** Table 4 shows all the metrics for “Employees” bucket and their definitions. This bucket has eight metrics. The source for Employees bucket is PeopleSoft.

Table 4

"Employees" Metrics Definitions Table

	Metric Header	Source	Definition
1.	# of Associates	PeopleSoft	This is the total number of FT and PT associates employed at the store at the end of the previous week.
2.	# of Managers Over Structure (Current Month)	PeopleSoft	This is the total number of managers still classified as "Assistant" or "Associate" managers
3.	# of Managers Over Structure	PeopleSoft	This follows the same definition as above, but as of the date, the store organization structure change was announced.
4.	# CSS's	PeopleSoft	This is the total number of Customer Service Specialist employed at the store at the end of the previous week.
5.	PT Turnover Current YTD	PeopleSoft	This is the percentage of turnover for part-time associates through the previous fiscal period of the current year
6.	PT Turnover Prev YTD	PeopleSoft	This is the percentage of turnover for part-time associates through the previous fiscal period of the previous year
7.	# PT Associates Over 30 Hours	PeopleSoft	This is the total number of part-time associates who worked more than 30 hours in the previous week
8.	Average # of PT Associates Over 30	PeopleSoft	Total Number of part-time associates who worked more than 30 hours per week since the start of the period / number of weeks in the period.

2. DTS activity: Table 5 shows all the metrics for "DTS Activity" bucket and their definitions. This bucket has total seven metrics. The source for DTS Activity bucket is Empower.

Table 5

"DTS Activity" Metrics Definitions Table

	Metric Header	Source	Definition
1.	Backroom Type	Task Manager	This is a categorization describing the features of the Stores stockroom.
2.	Goal CPH	Store Operations	This is the combined Carton per Hour processing to be achieved for both Unloading and Stocking
3.	Scheduled CPH	Empower	This is the scheduled number of cartons per hour to be unloaded and put-away. Actual Cartons / Scheduled DTS Coverage Hours
4.	Actual CPH	Empower	This is the actual number of cartons per hour which were put-away. Actual Cartons / Actual DTS Coverage Hours
5.	% of Stores at or Above CPH	Empower	The store has been +/- 2 cartons of goal for previous three weeks, the store is 100%. District Average would be Count of Stores in District +/- 2 cartons of goal for previous three weeks/number of Stores in District. Region Average would be Count of Stores in Region +/- 2 cartons of goal for previous three weeks/number of Stores in Region.
6.	CPH Actual (MTD)	Empower	This is the average number of cartons per hour which were put-away. (Actual Cartons MTD) / (Actual DTS Coverage Hours MTD)
7.	CPH Actual (YTD)	Empower	This is the average number of cartons per hour which were put-away. (Sum (Actual Cartons YTD / Week Number of Fiscal Year)) / (Sum (Actual DTS Coverage Hours YTD) / Week Number of Fiscal Year) / (Sum (Coverage Hours YTD)/ Week Number of Fiscal Year))

3. **Employee scheduling activity:** Table 6 shows all the metrics for "Employee Scheduling Activity" bucket and their definitions. This bucket has total nineteen metrics. The source for Employees Scheduling bucket is Empower.

Table 6

"Employee Scheduling Activity" Metrics Definitions Table

	Metric Header	Source	Definition
1.	Current Forecasted Hours	Empower	Planned payroll hours for the Current Week
2.	Current Scheduled Hours	Empower	Payroll hours booked in the Empower schedule for the Current Week.
3.	Previous Week Forecasted Hours	Empower	Planned payroll hours for the Previous Week
4.	Snapshot Scheduled Hours – Start of Week	Empower	Payroll hour booked in Empower schedule. Note, this is the same as the current week value from the previous week.
5.	Previous Week Scheduled Hours – End of Week	Empower	Payroll hours booked in Empower schedule at the end of the previous week.
6.	Previous Week Actual Hours	Empower	The sum of actual hours 'punched' by Store Employees.
7.	Previous Week % +/- to Actual to Empower Forecast	Empower	The variance of actual hours work to the forecast hours worked as a % for the previous week.
8.	Avg. % +/- Actual to Forecast (MTD)	Empower	The variance of actual hours worked to the forecast hours worked as a % for the month to date.
9.	Avg. % +/- Actual to Forecast (YTD)	Empower	The variance of actual hours worked to the forecast hours worked as a % for the year to date.
10.	Previous Week Auto Scheduled Job Edits	Empower	Count of manual edits made to the schedule.
11.	Avg. Auto Scheduled Job Edits (YTD)	Empower	Average of manual edits made to the schedule for the year to date
12.	Previous Week Auto Scheduled Job Quality Score	Empower	Calculated Schedule Score for the previous week
13.	Avg. Auto Scheduled Job Quality Score (YTD)	Empower	Current year to date average of Schedule Score for the store
14.	Previous Week Auto Scheduled Job Overs	Empower	Count of 15-minute increments when the Store scheduled included more personnel than the forecasted amount in the previous week
15.	Avg. Auto Scheduled Job Overs (MTD)	Empower	Average number of 15 min increments month to date where scheduled personnel exceeded personnel forecasted
16.	Avg. Auto Scheduled Job Overs (YTD)	Empower	Average number of 15 min increments year to date to date where scheduled personnel exceeded personnel forecasted
17.	Previous Week Auto Scheduled Job Under	Empower	Count of 15-minute increments when the Store scheduled included fewer personnel than the forecasted amount in the previous week
18.	Avg. Auto Scheduled Job Unders (MTD)	Empower	Count of 15-minute increments when the Store scheduled included fewer personnel than the forecasted amount in the previous week
19.	Avg. Auto Scheduled Unders (YTD)	Empower	Count of 15-minute increments when the Store scheduled included fewer personnel than the forecasted amount in the previous week

4. **Rewards:** Table 7 shows all the metrics for “Rewards” bucket and definitions. This bucket has nine metrics. The source for Rewards bucket is DW.

Table 7

“Rewards” Metrics Definitions Table

	Metric Header	Source	Definition
1.	Previous Week - Rewards Signup Weekly Goal	Finance Dept.	Target number of customers to be newly signed up for the rewards program each week.
2.	Previous Week - Rewards Signups	DW	Number of customer who were signed up in the previous week
3.	Rewards Signups Season to Date	DW	Number of customers who have signed up season to date
4.	Previous Week - % Rewards Transactions Goal	Finance Dept.	This is the target percentage of transaction where a rewards card is used.
5.	Previous Week - % Rewards Transactions	Point of Sale	This is the percentage of transaction where a rewards card was used.
6.	Rewards Transactions as % of Total Trans (YTD)		Count of transactions where rewards cards were used since the start of the year/count of all transaction since the start of the year.
7.	Previous Week - Average Sales $ Rewards Basket	DW	Sum of Sales where a reward card was used in the previous week/count of Sales where a reward card was used in the previous week.
8.	Previous Week - Average Sales $ Non Rewards Basket	DW	Sum of Non Rewards Sales in the previous week/count of Non Rewards Sales in the previous week.
9.	Previous Week - % Difference Rewards vs. Non Reward Basket	DW	This is the difference between Rewards basket vs non rewards basket.

5. **Sales and conversion:** Table 8 shows all the metrics for “Sales and Conversion” bucket and definitions. This bucket has twelve metrics.

Table 8

"Sales and Conversion" Metrics Definitions Table

	Metric Header	Source	Definition
1.	Sales $		
2.	Plan Sales $		
3.	Previous Week Sales % Change to Plan	POS	
4.	Previous Week Sales Rank (Store Within Region)	Derived	Based on Sales % Change to Plan
5.	Previous Week Sales Rank (District Within Company)	Derived	Based on Sales % Change to Plan
6.	Previous Week Comp Sales $ % Change to LY		
7.	Previous Week Average Basket Change % to LY		
8.	Previous Week UPT % Change to LY		
9.	Previous Week Transaction Change % to LY		
10.	Conversion %		This number represents the percentage of people we converted into paying customers on the previous Sunday to Saturday
11.	Avg. Conversion % (Last 4 Weeks)		This number represents the percentage of people we converted into paying customers over a rolling four weeks
12.	Avg. Conversion % (YTD)		This number represents the percentage of people we converted into paying customers in the fiscal year

6. **Sales (furniture, LTP and warranties):** Table 9 shows all the metrics of "sales" bucket and definitions. This bucket has total eleven metrics. The source for sales bucket is DW.

Table 9

"Sales (Furniture, LTP, and Warranties)" Metrics Definitions Table

	Metric Header	Source	Definition
1.	Previous Week - Furniture Sales	DW	Sale of items in Furniture Division for the Previous week. Use same formula as value
2.	Previous Week - Furniture Sales % Change to Plan	DW	+/- % of Furniture Sales plan for the Previous week
3.	Previous Week - Furniture as % of Total Sales	DW	Proportion of Total Sales that were for Items in the Furniture Division
4.	Furniture Sales YTD	DW	Sale of items in Furniture Division for the Current Year. Use same formula as value
5.	Furniture as % of Sales YTD	DW	Proportion of Total Sales that were for Items in the Furniture Division
6.	Previous Week - Count Warranties Sold	DW	Number Warranties sold – count number of Warranty SKUs in previous week's sales
7.	Previous Week - Warranty Sales	DW	Sum of Sls $ for Warranty SKUs from Previous Week – give list skus.
8.	Previous Week - Warranties as % of Total Sales	DW	Portion of Previous weeks's sales that included warranty divided by Sls $ for previous week.
9.	Previous Week - LTP Transactions	DW	Count of Transaction from Previous week where Tender Type is LTP. LTP Sales Units
10.	Previous Week - LTP Sales	DW	LTP Sls $ from Previous week where Tender Type is LTP
11.	Previous Week - LTP as % of Total Sales	DW	LTP Sales/ Sales $

7. **Sales reducing activities:** Table 10 shows all the metrics of "Sales Reducing Activities" bucket and their definitions. This bucket has total six metrics. The source for Sales Reducing Activities bucket is DW.

Table 10

"Sales Reducing Activities" Metrics Definitions Table

	Metric Header	Source	Definition
1.	Previous Week - Line Voids as % of Total Sales	DW	Sum the Retail Sales Amount for Line Item Status is Void for all completed Sales and divide by Sls$
2.	Previous Week - Post Voids as % of Total Sales		
3.	Previous Week - Returns Rate to Sales		
4.	Previous Week - Sales Price Variance		
5.	Previous Week - Mark Out of Stock Rate to Sales		
6.	Previous Week - Total Markdowns as a % of Sales		

Collecting the data. Once we identify and define all the metrics, next step was to do the calculations to obtain the final value. And automate the data from source files to DW. The following tables show how to do the calculations and how the data was stored in DW. The tables have three columns.

1. The first column is calculation, which shows the calculations that need to be done to get the final value.
2. The second column is value type, this tells us what is the type of the final value and how to calculate it. For instance, the value type is (Percentage, Average), which means the final value will be a percentage of the average of all the values.
3. The third column is (view in DW), this tells us under what view the column resides in DW.

There are no calculations for sales reducing activities.

1. **Employees:** Table 11 shows the calculations of “Employees” bucket, their value types and the views they belong to in DW.

Table 11

"Employees" Data Warehouse Table

	Calculation	Value Type	View in DW
1.	tot_assoc_last_week_nbr	Value, Sum	PEOPLE_STATS
2.	tot_mgr_begin_month_nbr	Value, Average	PEOPLE_STATS
3.	tot_mgr_begin_month_nbr where week_end_dt = March 7 2015	Value, Average	PEOPLE _STATS
4.	tot_css_las_week_nbr	Value, Average	PEOPLE _STATS
5.	(annual_voluntary_term_qty+annual_involuntary_term_qty) divided by (period_summary_avg_emp_qty / periods_in_year_nbr) where emp_status_cd = PT and manager_level_cd = 3 and fiscal_period_nbr = last period and fiscal_year_nbr = current year	Percentage, Average	TURNOVER_DATA
6.	(annual_voluntary_term_qty+annual_involuntary_term_qty) divided by (period_summary_avg_emp_qty / periods_in_year_nbr) where emp_status_cd = PT and manager_level_cd = 3 and fiscal_period_nbr = last period and fiscal_year_nbr = previous year	Percentage, Average	TURNOVER_DATA
7.	Tot_assoc_gt_30_last_week_nbr	Value, Average	PEOPLE _STATS
8.	Tot_assoc_gt_30_year_nbr	Percentage, Average	PEOPLE_STATS

2. **DTS activity:** Table 12 shows the calculations of "DTS Activity" bucket, their value types and the views they belong to in DW.

Table 12

"DTS Activity" Data Warehouse Table

	Calculation	Value Type	View in DW
1.	Stockroom_type_cd	Text	STOCKROOM_TYPE
2.	Cartons_per_hour_goal_nbr	Value, Average	STOCKROOM_TYPE_ CPH_GOAL
3.	Actual_carton_units_wtd_qty/schedule_cover_hrs_dts_wtd_qty	Product, Average	LABOR_SCHEDULING
4.	Actual_carton_units_wtd_qty/actual_hours_dts_ wtd_qty	Product, Average	LABOR_SCHEDULING
5.	Calculation – Count of Stores where Avg. (Actual_carton_units_wtd_qty/actual_hours_dts_ wtd) for 3 most recent weeks are > = (Goals CPH – 2.0)/Number of Stores in District, Region	Percentage, Percentage	LABOR _SCHEDULING
6.	Actual_carton_units_mtd_qty/actual_hours_dts_ mtd_qty	Average, Average	LABOR _SCHEDULING
7.	Actual_carton_units_ytd_qty/actual_hours_dts_ytd_qty	Average, Average	LABOR _SCHEDULING

3. **Employee scheduling activity:** Table 13 shows the calculations of "Employee Scheduling Activity" bucket, their value types and the views they belong to in DW.

Table 13

"Employee Scheduling Activity" Data Warehouse Table

	Calculation	Value Type	View in DW
1.	Forecast_hours_wtd_qty	Value, Average	LABOR _SCHEDULING
2.	Scheduled_hours_wtd_qty	Value, Average	LABOR _SCHEDULING
3.	Forecast_hours_wtd_qty from previous week	Value, Average	LABOR_SCHEDULING
4.	Scheduled_hours_wtd_qty from previous week + 1	Value, Average	LABOR _SCHEDULING
5.	Scheduled_hours_wtd_qty from previous week	Value, Average	LABOR_SCHEDULING
6.	Actual_hours_wtd_qty from previous week	Value, Average	LABOR _SCHEDULING
7.	(Forecast_hours_wtd_qty – actual_hrs_wtd_qty)/ Forecast_hours_wtd_qty from previous week	Product, Average	LABOR _SCHEDULING
8.	(Forecast_hours_mtd_qty – actual_hrs_mtd_qty)/ Forecast_hours_mtd_qty from previous week	Product, Average	LABOR _SCHEDULING
9.	(Forecast_hours_ytd_qty – actual_hrs_mtd_qty)/ Forecast_hours_ytd_qty from previous week	Product, Average	LABOR _SCHEDULING
10.	Schedule_edits_wtd_qty from previous week	Value, Average	LABOR _SCHEDULING
11.	Schedule_edits_ytd_qty/week number	Product, Average	LABOR _SCHEDULING
12.	Schedule_rate_wty_qty previous week	Value, Average	LABOR _SCHEDULING
13.	Schedule_rating_ytd_qty	Value, Average	LABOR _SCHEDULING
14.	Scheduled_over_qtr_hours_wtd_qty for previous week	Value, Average	LABOR _SCHEDULING
15.	Scheduled_over_qtr_hours_mtd_qty/Week number of month	Product, Average	LABOR _SCHEDULING
16.	Scheduled_over_qtr_hours_ytd_qty/Week number of year	Product, Average	LABOR _SCHEDULING
17.	Scheduled_under_qtr_hours_wtd_qty for previous week	Product, Average	LABOR_SCHEDULING
18.	Scheduled_under_qtr_hours_mtd_qty/Week number of month	Product, Average	LABOR_SCHEDULING
19.	Scheduled_under_qtr_hours_ytd_qty/Week number of year	Product, Average	LABOR_SCHEDULING

4. **Rewards:** Table 14 shows the calculations of “Rewards” bucket, their value types and the views they belong to in DW.

Table 14

“Rewards” Data Warehouse Table

	Calculation	Value Type	View in DW
1.	Rewards_pct_signup_goal_nbr	Value, Average	Rewards_Goals
2.	Use value from Rewards Report – Column Titled “Cards Issue Actual Store (Last Week)	Value, Average	
3.	Use method from Rewards Report – Column Titled “Cards Issue Actual Store summing cards issued in the last fiscal year	Value, Average	
4.	Rewards_pct_weekly_trans_nbr	Value, Average	Rewards_Goals
5.	Use value from Rewards Report – Column Titled “% Rewards Transactions”	Percentage, Average	
6.		Percentage, Average	
7.	Use same constraints to calculate BSKT $ on Weekly Sales Recap – Chris Nay’s Report	Value, Average	
8.	Weekly Basket Report – Calc.	Value, Average	
9.		Percentage, Average	

5. **Sales and conversion:** Table 15 shows the calculations of “Sales and Conversion” bucket, their value types, and the views they belong to in DW.

Table 15

"Sales and Conversion" Data Warehouse Table

	Calculation	Value Type	View in DW
1.	net_sale_retail_amt		LOCATION_STORE_DAY
2.	plan_net_sale_retail_amt		LOCATION_STORE_DAY
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.	Total Transactions / Total Traffic Traffic_count_out_qty	Percentage	STORE_TRAFFIC
11.	Total Transactions in the last four weeks / Total Traffic in the last four weeks	Percentage	
12.	Total Transactions for the fiscal year / Total Traffic for the fiscal year	Percentage	

6. **Sales (furniture, LTP, and warranties):** Table 16 shows the calculations of "Sales" bucket and their value types.

Table 16

"Sales (Furniture, LTP, and Warranties)" Data Warehouse Table

	Calculation	Value Type	View in DW
1.	Match to Total Sls$ Division on Weekly Sales and Insight Report for Division 9	Value, Sum	
2.	Match to Pln Sls $ given on District Furniture Sales NC Report.	Percentage, Average	
3.	Furniture Sales/Total Sales for Previous Week	Percentage, Average	
4.		Value, Sum	
5.	Furniture Sales/Total Sales for Current Year	Percentage, Percentage	
6.	Warranties are only sold in pilot stores. Not yet in NC report.	Value, Sum	
7.	Use the same method as Sls$ on Weekly Sales report and limit values to Warranty SKS	Value, Sum	
8.		Percentage, Percentage	
9.		Sum, Sum	
10.		Sum, Sum	
11.		Percentage, Percentage	

Data Analysis

Dashboard models. After we did all the calculations and collected all the data into DW, next step is to design and develop the reports. Once the design and development parts completed, we manually ran all the reports. The below figures show the dashboard mockups for each bucket.

1. **Employees:** Figure 2 shows the dashboard mock-up for “Employees” bucket.

Employees										
			Previous Week			Previous Week			Two Weeks Prior	
Region	District	Store	# of Associates	# Mgrs. over Structure Current Month	#Mgrs. Over Structure	# of CSS's	PT Turnover Current YTD	PT Turnover Prev YTD	# PT Associates Over 30 Hours	Average # of PT Associates Over 30
Region Average										
District Average										
1		1	#(SUM)	#(SUM)	#(SUM)	#(SUM)	%	%	#(SUM)	#(AVG)

Figure 2. “Employees” dashboard model.

2. **DTS activity:** Figure 3 shows the dashboard model for “DTS Activity” bucket.

Labor - DTS Activity											
						Previous Week					
Region	District	Store	Backroom Type	Data Source	Goal CPH	Scheduled CPH	Actual CPH	% of Store at or Above CPH	Actual CPH (MTD)	Actual CPH (YTD)
Region Average											
District Average											
1	1	1	T-#	Empower	#	#	#	+/- %	#	#

Figure 3. “DTS Activity” dashboard model.

3. **Employee scheduling activity:** Figure 4 shows the dashboard model for "Employee Scheduling Activity" bucket.

Labor - Scheduling Activity

			Two Weeks Prior		Previous Week							Previous Week		Previous Week		Previous Week		Previous Week			
Region	District	Store	Current Forecasted Hours	Current Scheduled Hours	Forecasted Hours	Snapshot Scheduled Hours (Week Day 1)	Scheduled Hours (Week Day 7)	Actual Hours	% +/- Actual to Forecast	Avg. % +/- Actual to Forecast (MTD)	Avg. % +/- Actual to Forecast (YTD)	Auto Scheduled Job Edits	Avg. Auto Scheduled Job Edits (YTD)	Auto Scheduled Job Quality Score	Auto Scheduled Job Quality Score (YTD)	Auto Scheduled Job Overs	Avg. Auto Scheduled Job Overs (MTD)	Avg. Auto Scheduled Job Overs (YTD)	Auto Scheduled Job Unders	Avg. Auto Scheduled Job Unders (MTD)	Avg. Auto Scheduled Unders (YTD)
Region Average																					
District Average																					
1	1	1	# (SUM)	# (SUM)	# (SUM)	# (SUM)	# (SUM)	# (SUM)	+/- %	+/- %	+/- %	#	# (AVG)	#	#	# (SUM)	# (AVG)	# (AVG)	# (SUM)	# (AVG)	# (AVG)

Figure 4. "Employee Scheduling Activity" dashboard model.

4. **Rewards:** Figure 5 shows the dashboard model for "Rewards" bucket.

Rewards

			Previous Week				Previous Week			Previous Week		
Region	District	Store	Rewards Sign Ups Weekly Goal	Rewards Signups	Rewards Signups Season to Date	Rewards Signup Seasonal Goal	% Rewards Transactions Goal	% Rewards Transactions	Rewards Transactions as % of Total Trans (YTD)	Average $ Rewards Basket	Average $ Non Rewards Basket	% Difference Rewards vs. Non Reward Basket
Region Average												
District Average												
1	1	1	# (SUM)	# (SUM)	# (SUM)	# (SUM)	%	%	%	$# (AVG)	$# (AVG)	+/- %

Figure 5: "Rewards" dashboard model.

5. **Sales and conversion:** Figure 6 shows the dashboard model for "Sales and Conversion" bucket.

Sales Activity and Conversion

			Previous Week					Previous Week			Previous Week					
Region	District	Store	Sales % Change to Plan	Sales Rank (Store Within Region)	Sales Rank (District Within Company)	Sales % Change to Plan (MTD)	Sales % Change to Plan (YTD)	Comp Sales $ % Chg to LY	Comp % Rank (Store Within Region)	Comp % Rank (District Within Company)	Average Basket Change % to LY	UPT % Change to LY	Transaction Change % to LY	Conversion %	Conversion % (4 wk Avg)	Conversion % Avg YTD
Region Average																
District Average																
1	1	1	+/- %	#	#	+/- %	+/- %	+/- %	#	#	+/- %	+/- %	+/- %	+/- %	+/- %	+/- %

Figure 6: "Sales and Conversion" dashboard model.

6. **Sales (furniture, LTP, and warranties):** Figure 7 shows the dashboard model for “Sales” bucket.

Furniture, Warranties, and LTP

			Previous Week					Previous Week			Previous Week			
Region	District	Store	Furniture Sales	Furniture Sales % Change to Plan	Furniture as % of Total Sales	Furniture Sales YTD	Furniture as % of Sales YTD	Count Warranties Sold	Warranty Sales	Warranties as % of Total Sales	LTP Transactions	LTP Sales	Sales as % of LTP Plan Goal	LTP as % of Total Sales
Region Average														
District Average														
1	1	1	$# (SUM)	+/- %	%	$# (SUM)	%	# (SUM)	$# (SUM)	%	# (SUM)	$# (SUM)	%	%

Figure 7: “Sales” dashboard model.

7. **Sales reducing activities:** Figure 9 shows the dashboard model for “Sales Reducing Activities” bucket.

Sales Reducing Activities

			Previous Week					
Region	District	Store	Line Voids as % of Total Sales	Post Voids as % of Total Sales	Returns Rate to Sales	Sales Price Variance	Mark Out of Stock Rate to Sales	Total Markdowns as a % of Sales
Region Average								
District Average								
1	1	1	%	%	%	%	%	%

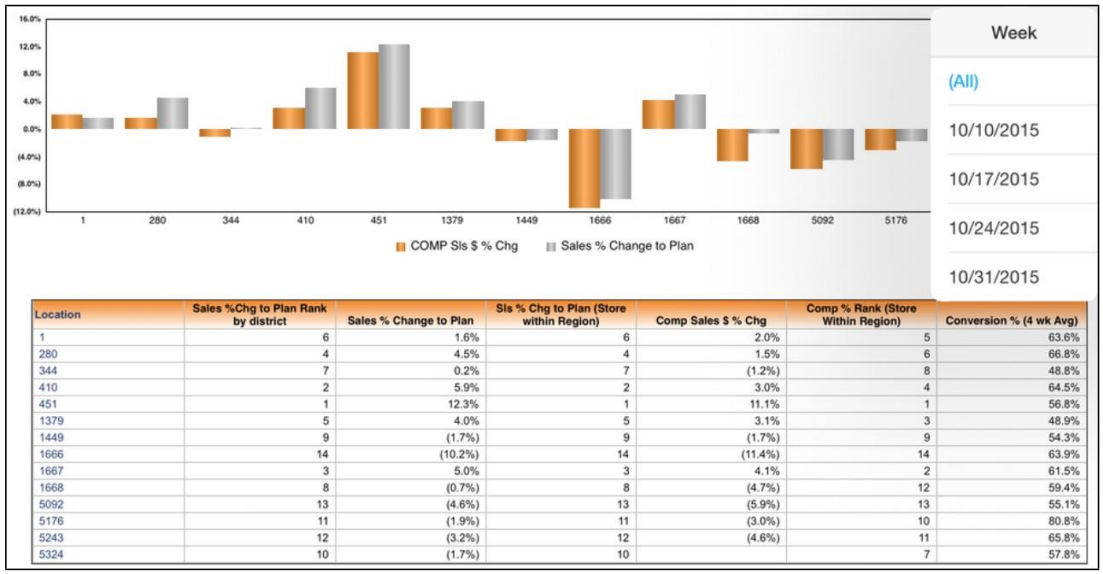
Figure 8: “Sales Reducing Activities” dashboard model.

We analyzed all the data and generated graphical forms using excel tool which helps in understanding the data quickly.

As we automated the data from source files into DW, the time required to process a report is reduced by 95.83%.

It used to take almost 2 hours to generate the reports every day. Now on an average, the report execution time is 5 minutes.

Figure 9 shows the statistical display of sales bucket on the dashboard.



Location	Sales %Chg to Plan Rank by district	Sales % Change to Plan	Sls % Chg to Plan (Store within Region)	Comp Sales $ % Chg	Comp % Rank (Store Within Region)	Conversion % (4 wk Avg)
1	6	1.6%	6	2.0%	5	63.6%
280	4	4.5%	4	1.5%	6	66.8%
344	7	0.2%	7	(1.2%)	8	48.8%
410	2	5.9%	2	3.0%	4	64.5%
451	1	12.3%	1	11.1%	1	56.8%
1379	5	4.0%	5	3.1%	3	48.9%
1449	9	(1.7%)	9	(1.7%)	9	54.3%
1666	14	(10.2%)	14	(11.4%)	14	63.9%
1667	3	5.0%	3	4.1%	2	61.5%
1668	8	(0.7%)	8	(4.7%)	12	59.4%
5092	13	(4.6%)	13	(5.9%)	13	55.1%
5176	11	(1.9%)	11	(3.0%)	10	80.8%
5243	12	(3.2%)	12	(4.6%)	11	65.8%
5324	10	(1.7%)	10		7	57.8%

Figure 9: Dashboard.

Summary

This chapter explained in detail how the data collection and analysis was done and the steps included. The data collected was presented.

Chapter V: Results, Conclusion, and Recommendations

Introduction

This chapter is a conclusion of the document. It gives a detailed understanding of what was achieved by the implementation of this project and conclusion of this project. It also suggests certain recommendations for further analysis.

Results

The dashboard was successfully implemented after getting it tested in select stores. The deployment was successful. It answered all the possible questions that were raised at the beginning of the project. The performance reports were generated in very less time and the process is completely automated. Store managers are highly satisfied with the dashboard. The project questions and detailed explanations of each question are as follows.

1. What are the metrics need to appear on the dashboard and based on which objectives they are measured?

   At the time of requirements gathering, the business team talked to store managers and gather the information. After gathering the information, they analyzed all the data and identified seven dashboard buckets and collected the metrics for each bucket.

   The main dashboard buckets are “Employees”, “DTS Activity”, “Employee Scheduling Activity”, “Rewards”, “Sales and Conversion”, “Sales (Furniture, LTP, and Warranties)”, and “Sales Reducing Activities”. All the metrics of each bucket are shown in data presentation section.

2. Will the collected metrics be sufficient to achieve the desired output?

   Most of the metrics were sufficient in achieving the desired output. But some store managers requested more metrics in the middle of the project. Those metrics were also added to the metrics list then.

3. What percent of time efficiency will be achieved with the excel-based store dashboard and how accurate will this dashboard be?

   We have achieved 95%-time efficiency over the previous process. All the data was very accurate.

4. What are the satisfactory levels of the end user?

   We got 97% positive feedback from store managers. End user liked the dashboard and looking forward to the web and mobile applications.

Conclusion

The project is a big success with 100% data efficiency. The excel- dashboard works as expected. The time efficiency was achieved as expected.

This project helps the store managers to see the performance reports instantly and this saves a lot of time and human effort in generating performance reports of the individual store. Also, this helps the store managers to compare the daily performance of the store, with that they can plan accordingly to increase the store performance.

The dashboard was very user-friendly with a lot of options for sorting and analysis. Since the dashboard was built with MS excel, it will be easy to do a lot of analysis, which will help the store managers in their planning strategies.

Recommendations

The project was very well planned and properly implemented. These are the few recommendations for future development of the project.

- Access to the dashboard and report data should be given according to the role of the user.
- It is highly recommended that debug logs are added to the DB update code so that we can keep track of all the information and react to any situation immediately.

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Appendix

We have developed a Feedback Button to Ensure the stores give out Feedback on a daily Basis. The following questions were included in the feedback form. All the questions were rated with 1 to 5 numbers except the last one. (1-very satisfied, 2-somewhat satisfied, 3-neutral, 4-somewhat dissatisfied, 5-very dissatisfied).

Questions:

1. Ease of access to the dashboard?
2. How well organized is the dashboard?
3. Ease of use of the dashboard?
4. How easy was the underlying data to understand?
5. Overall how satisfied were you with the dashboard?
6. Please give us some suggestions to improve the dashboard.